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HOUSEHOLD SURVEY OF INJURIES IN A KENYAN DISTRICT
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ABSTRACT

Objective: **To determine the pattern and burden of injuries, their causes and action taken in a rural and urban community in Kenya.**
Design: **Household interview survey and focus group discussions.**
Setting: **Four rural villages and five urban clusters in Kiambu District, Kenya.**
Subjects: **A total of 1,980 members of 200 rural and 230 urban households.**
Results: **The number of reported injuries was 495, corresponding to 300,000 injuries per 100,000 people per year. Most common were cut or piercing (38.4%), followed by fall (16.2%), burn or scald (14.3%), animal bite or kick (10.1%), hit by moving object (5.9%) and road traffic accident (3.6%). Poisoning, sub-mersion/drowning and explosion were uncommon, each below three per cent. Of all reported injuries, 149 (30.1%) sought care from traditional healers, 91 (18.4%) were subject to self-care, 76 (15.4%) obtained service from drug shops, 22 (4.4%) were brought to a health facility for attention and 17 (3.4%) took no action at all. Additional information was obtained through focus group discussions with students, teachers and members of women groups. These generated detailed information about cases of sexual assault within and outside households which had not been captured during the previous household interviews.**
Conclusion: **Injuries are very common but most of them are mild, prompting only home care or no action at all. Only one out of 25 injuries were brought to a health facility for attention. Some types of injury, such as domestic violence and sexual assault, are more likely to be captured through focus group discussions than during household interviews. A combination of methods is likely to best reflect the pattern of injury at community level.**

INTRODUCTION

The burden of injuries in industrialised countries is generally high, ranking fifth among the causes of death for example in the US(1). It is also common in many developing countries such as Nigeria(2), Kenya(3), and Ethiopia(4), but a large proportion remain unrecorded and unreported due to low service coverage and inability of poor households to pay for services at hospitals and clinics. Facility based routine information systems also tend to aggregate data on different kinds of injuries, and this complicates data analysis.

Many different conditions are included in the injury concept: falls, burns, road traffic injuries, assaults, poisonings, drownings, accidental cuts and piercings, animal attacks including bites and stings, and suicide. Kenya belongs to a group of developing countries with relatively few motor vehicles (17/1300 population) but a high rate of motor vehicle related fatalities (10-15 per 100,000 people/year)(5). Fall, assault, burn and poisoning are also likely to be common, each with some 10-15 annual fatalities/100,000 population.

Injury control is emerging as a prominent policy issue in developing countries. Injury prevention in developing countries was addressed by Mohan(6) who studied childhood injuries in India, by Asogwa(7) who has conducted several studies in Nigeria, by Hicks(8) who studied traffic accidents in Kenya, by Osuntogun and Olundimu(9) who explored domestic accidents in Nigeria and by Katsivo *et al* (10) who studied domestic injuries in Nairobi on the basis of health facility data.

Regarding road traffic injuries it has been estimated that 20-30% of driver/passenger deaths can be prevented with proper restraints in the vehicles. An assessment of Nigerian efforts to control RTAs has been published by Asogwa(11). A Nigerian study of hospitalised burns showed that most were caused by accidents with kerosene contaminated before delivery to domestic consumers(12).

While past research on injury prevention in developing countries has been scanty and uncoordinated, attention from policy-makers and researchers has increased. This study was aimed to generate population-based data on all kinds of injury in a rural and an urban community in Kenya and to explore opportunities for injury prevention.

MATERIALS AND METHODS

Study area: The study was conducted in the rural location of Githunguri about 50 km northwest of Nairobi and in the district capital Kiambu in Kiambu district, both dominated by

ethnic Kikuyu. Githunguri is an agricultural area with coffee and tea as the main cash crops and maize, potatoes, and vegetables as common food crops. Most community members are small scale farmers who use insecticides, fungicides and considerable amounts of fertilizers to improve the yields. Horticulture is expanding, particularly among the younger farmers. The Department of Community Health, University of Nairobi, had previously studied health aspects of farming practices in the area and already had data on villages in the location.

Methods: The study population comprised a total of 1,980 individuals from 430 households in nine villages: four rural villages in Githunguri location and five urban clusters in Kiambu municipality, all selected randomly from lists of villages developed during previous studies in the area by these investigators. The selection was a two stage cluster sampling in which, following the convenience selection of a known location, the first stage was a random selection of villages, each of which was one cluster. The households, as the primary study units, were selected from within each cluster by randomly picking a starting point and then moving from that house to the next nearest in a random direction until the predetermined number of households in that particular cluster had been reached. In total, 200 rural and 230 urban households were included.

Four interviewers, two males and two females, were selected on the basis of qualification, experience and personal interview. They underwent two weeks or training on data gathering techniques, on rapport building and on probing and scoring of information. The training included questionnaire pre-testing and was conducted by the investigators. The interview protocol, developed on the basis of a questionnaire used in Kenya in a study of accidental poisoning and one used by WHO for a study of road traffic accidents, was pre-tested in a different location in Kiambu district and then revised, the recall period being reduced from one month to two weeks. The interviewers visited the selected homes interviewing household heads, in a few instances with the spouse as a proxy.

Variables: The variables included type, time and place of injury during the two-week recall period, the circumstances surrounding the injury, the body part affected, severity of the injury, age, sex, occupation and other attributes of the victim, action taken, care received, and costs and expenditure incurred by the households.

Focus group discussions regarding different forms of injuries were held with homogenous groups of women, school children, male and female teachers and factory workers in the same area in order to explore local community perception of injuries, their causes and appropriate preventive interventions. The discussions were led by a social scientist experienced with the method.

Analysis: After completing and checking the pre-coded questionnaires the data were entered onto a computer using the SPSS software. Analysis included simple injury frequencies by cluster and by type of injury, cross-tabulations of type of injury against sex, age, education, occupation, and site of injury. Age and sex specific incidences were determined and comparisons made between rural and urban clusters. Injury occurrence was compared with various characteristics of the individual such as education and occupation. The notes from the focus groups were condensed, reviewed and structured by type of injury, then analysed manually with special attention to similarities and contrast.

RESULTS

Household survey: There were a slightly more females in the study sample (51.9%), and a high proportion of children below 15 (55.3%). The educational background of the sample is shown in Table 1 and the occupational profile in Table 2.

Table 1

Levels of education of the sample population

Education	Frequency	%
Nursery school	303	15.3
Std. 1 - Std. 4	538	27.2
Std. 5 - Std. 8 (inclusive)	109	5.5
Std. 8 + training	22	1.1
Form 1 - 4 (inclusive)	124	6.3
Form 4 + training	130	6.6
University	7	0.4
Adult literacy classes	3	0.2
N/A (less than 3 years or missing)	744	37.6
Total	1,980	100

Table 2

Occupations of the sample population

Occupation	Frequency	%
Salaried	72	3.6
Casual labourer	9	0.5
Self employed/farmer	20	1.0
Self employed/business	32	1.6
Student	1113	56.2
Not employed	14	0.7
N/A	720	36.4
Total	1,980	100

The general pattern of reported injuries in the sample during the recall period is shown in Table 3. The most common injury comprised cuts or piercing with a sharp object (190 injuries or 38.4% of all injuries) followed by falls (80/16.2%), burns (71/14/4%), animal bites, stings and kicks (50/10.1%) and hits by moving objects (19/3.8%) while road traffic accidents numbered only 18 (3.6%).

Table 3

Injuries reported by respondents

Type	No.	%	Incidence/ 100,000/year
Cut/piercing	190	38.4	115,200
Fall	80	16.2	48,600
Burn/scalding	71	14.3	42,900
Animal/insect bites	50	10.1	30,300
Hit by object	29	5.9	17,700
Road traffic accident	18	3.6	10,800
Poisoning	10	2.0	6,000
Assault	4	0.8	2,400
Electrocution	4	0.8	2,400
Occupational injury	3	0.6	1,800
Explosion	1	0.2	600
Drowning, submersion	1	0.2	600
Asphyxiation/strangulation	1	0.2	600
Sexual abuse or assault	1	0.2	600
Other	32	6.5	19,500
Total	495	100	300,000

The type of accident by occupation is shown in Table 4, which demonstrates that children, including students and other children, are the most common victims and that cuts, falls and burns are the most frequent injury types (Table 4).

The patterns of injuries in males and females (Table 5) are largely similar, but cuts and burns/scalds are much more common in female than in male adults while the opposite applies to road traffic accidents. Reported action taken by type of injury is shown in Table 6, suggesting that traditional healers, self-care and drug shop services are the most common remedies while few bring the reported injuries to clinics or hospitals.

Table 4

Type of accident, by occupation

Type	Salaried employees	Self-employed	Casual labour	Students	Others	Total
Fall	3	18	5	31	23	80
Hit by object	0	1	0	22	6	29
Cut/piercing	6	52	9	90	33	190
Burn/scalding	10	20	1	23	17	71
Animal bite/attack	0	27	0	17	19	50
Drowning/submersion	0	0	0	0	1	1
Road accident	3	3	0	12	0	18
Explosion	0	0	0	1	0	1
Poisoning	3	0	0	5	2	10
Asphyxia/strangul.	0	0	0	1	0	1
Electrocution	0	2	0	1	1	4
Occupational injury	1	0	1	0	1	3
Sexual abuse/assault	0	0	0	1	0	1
Other	1	3	0	20	8	32
Total	28	128	16	225	98	495

Table 5

Injury by age and sex

Injury	0-4		5-14		15-24		25-44		45-64		65+		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Fall from height	6	9	12	15	3	3	3	12	6	7	4	0	34	46
Hit by moving object	3	1	11	8	3	2	1	0	0	0	0	0	18	11
Cut, piercing	12	7	33	40	13	36	5	33	0	11	0	0	63	127
Burn or scalding	1	11	7	9	2	16	1	19	0	5	0	0	11	60
Explosion	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Poisoning	0	2	3	1	1	1	0	1	0	1	0	0	4	6
Animal/insect bite, sting, animal kick	1	3	8	5	3	8	1	13	0	8	0	0	13	37
Road traffic accident	1	0	3	2	7	1	2	1	0	1	0	0	13	5
Drowning/submersion	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Asphyxia or strangulation	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Electrocution	0	0	0	0	1	2	0	1	0	0	0	0	1	3
Occupational injury	0	0	0	0	1	0	1	1	0	0	0	0	2	1
Assault with or without weapon	0	0	0	2	0	2	0	0	0	0	0	0	0	4
Sexual abuse or assault; rape	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Other foreign bodies ear, nose, birth canal	3	6	11	5	2	0	0	3	0	2	0	0	16	16
Total	27	39	91	87	37	71	14	84	6	35	4	0	179	316

Table 6

Actions reportedly taken against the injuries mentioned

	0-14	15-24	25-44	45-64	65+	Total
Health facility	9	3	5	5	0	22
Drug shop remedy	59	3	14	2	0	76
Traditional healer	74	45	18	12	0	149
Help of relative	16	11	12	6	1	46
Self care/self-medication	20	35	22	12	2	91
No action	0	8	4	4	1	17
Other	0	3	1	0	0	4
Don't know/not stated	66	0	22	0	0	88
Total	244	108	98	41	4	495

Focus group discussions (FGDs): FGDs with teachers suggested that burns were common among children, partly due to poor parental supervision and inability among young house-girls to handle kitchen equipment safely, such as paraffin stoves. Falls from trees and in staircases were reported to be common.

Cuts from tins and broken bottles often occur in children playing outdoors around their homes and otherwise from knives, axes and pangas. Sports injuries like sprains, dislocations and sometimes fractures are particularly common during team sports in the school environment.

Violence such as fights are common in bars in association with drinking and in crowded urban slums where home-brewed alcohol is consumed and crime rates are high. Law enforcement against reported crimes is said to be weak which prompts people to take the law in their own hands; instances of mob justice has caused serious injury.

FGDs with teachers also identified incest as common and usually kept secret within the family because of the stigma; some fathers take advantage of their daughters using their authority within the family and the absence of the mother. Drug taking, crowding with close interaction in small dwellings and "western culture" in the form of mothers working away from home were mentioned as factors contributing to incest. Some discussants stated that most incest cases were consented, not forced.

Rape and defilement of nursery and primary school girls were said to be common in Kiambu, especially in coffee plantations, and mostly go unreported. Law enforcers were said to have a relaxed. "I don't care" attitude to the problem and victims were claimed to have been subject to abuse by the police. "People suffer without justice". Again, drug use was mentioned as a related problem. Mothers are described as "helpless" in many such cases and have to deal with the situation as a family matter.

Road traffic accidents were said to be common along the main roads, but it is difficult to compare with domestic injuries which are rarely reported. The problem is aggravated by farmers encroaching on roadsides leaving no walking paths for pedestrians and bicycles. Overspeeding, unroadworthy vehicles, lack of road signs and lack of pedestrian pavements were mentioned as explanations.

When discussing prospects for injury prevention, teachers felt people should avoid travelling at night between 8 and 10 pm to avoid assault, that poisonous liquids should be carefully stored and kept away from children, that poor roads should be repaired, streets well lit-and paths reserved for pedestrians. On the subject of incest, teachers felt that mothers should communicate with their daughters freely and teachers should create story-telling to educate the girls on such issues. They underscored that "sex education should be taught separately for boys and girls and to older children only".

FGDs with groups of school children mentioned hot steam, boiling water during cooking, leaking gas cookers, hurricane lamps and tin lamps which may explode as common causes of burns; "people should be educated how to use home appliances such as gas and electric cookers to avoid accidental burns". Students did not perceive road traffic accidents as common in the project area but "only common in big towns like Nairobi". They advocated action against all unroadworthy vehicles and against policemen taking bribes. Assault was said to be common, targeting known households and people and linked to unemployment, drug taking and drinking. "Beer is a major contributing factor". There were different opinions regarding the frequency of rape and incest, but several specific cases were mentioned during FGDs. Some discussants advocated sex education in schools, education of young women on dress codes and risk-avoiding behaviour, such as walking outdoors at night.

DISCUSSION

The project area, within 50-70 km from Nairobi, has a population with an above average per capita income. The household survey generated a very high incidence of reported injuries, 3,062/1,000 population/year, most of

which were mild and prompting self-care or no action. An incidence rate of 64,000/100,000/year was recorded in the early 1960s in Punjab, India(13) while most injury household surveys have found lower rates, for example in Chile (30,300/100,000) and Venezuela (22,000/ 100,000)(14). This confirms the assumption that injuries appearing at health facilities represent only a small proportion of all. The methodology applied in our study captured also very minor injuries which could explain the higher incidence recorded in Kiambu. We conclude that a study of this kind, in addition to recording remedial action taken, should include some form of injury severity indicator, for example the duration of any temporary disability following the injury.

Interviewers were often left with incomplete information which caused some gaps in the data. This was in many cases due to the absence of the head of household in which case a less well-informed proxy, such as a grandparent or a teenage child, became the respondent.

Facility-based routine records are not helpful in analysing the chain of events leading to an injury but may, in hospitalised cases, provide useful data on the kind of injury sustained. Outpatient records are usually incomplete and often missing. A special injury recording system is apparently required to study cases seeking help at health facilities.

The focus group discussions generated numerous case descriptions and considerable exchange of experiences and views on domestic violence, rape and incest, issues rarely mentioned during ordinary household interviews. They also revealed people's perceptions of risk, frequencies of reported and unreported accidents and injuries and their views on possible interventions, all helpful in the development of injury control programmes. We recommend the use of combinations of methods in future studies as they tend to capture different parts of the injury spectrum.

We propose the following issues for further research on injuries: (i) household interview surveys in different geographical and socio-economic groups, with applications of a severity indicator, for example duration of temporary disability; (ii) knowledge, attitude and practices (KAP) studies in different groups about injury prevention measures, their effectiveness and local acceptability; (iii) developing and testing of injury recording/reporting systems; (iv) the epidemiology of work-site injuries: occurrence, type, severity, costs, circumstances, prevention; (v) road accident injury prevention: testing and evaluation of methods involving several sectors and institutions; and (iv) epidemiology of injuries among youth in and out of school.

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